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ABSTRACT

Access to telecommunications and technology are essential for future social and economic viability. Economic class relates directly to level of educational attainment and education will very soon be tied to a person's ability to get online; therefore, "getting online" is not only access to information and resources, it is access to learning and to power. Access, or "getting online," is much more than merely constructing a building, running wire, and dropping in workstations. Providing access includes identifying areas that need access, designing a physical infrastructure to house the access, and ensuring that the interfaces between the devices that provide access and the access itself are culturally and linguistically accessible. To provide access for everyone, technologic access must be brought to the community. Suggestions for providing equitable access include: understanding and celebrating individuals' differences and creating a sense of community; designing interfaces that are easily understandable and accessible by those who may not have the skill-mastery level or linguistic understanding that is assumed appropriate for technology; building trust in technology by building trust in society; designing facilities that utilize the best technology in environments where people can sit, be comfortable, and realize their own potentials; and by designing technology in such a way that it begs to be used rather than begs to be ignored. (Contains 23 references.) (SWC)

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Field of Techno-Dreams: If You Build It, Will They Come, and What If They Do? Issues of Equity Online

By:

Mike Menchaca

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FIELD OF TECHNO-DREAMS: IF YOU BUILD IT, WILL THEY COME, AND WHAT IF THEY DO? ISSUES OF EQUITY ONLINE

Mike Menchaca
Pepperdine University
<chaka@csus.edu>

"Are we living in the middle of a great revolution, or are we just members of another arrogant elite talking to ourselves? Are we a powerful new kind of community or just a mass of people hooked up to machines? Do we share goals and ideals, or are we just another hot market ready for exploitation by America's ravenous corporations? Can we construct a more civil society with our powerful technologies?" --Jon Katz (Katz, 1997, p. 49, http://www.wired.com/5.04/netizen)

WHAT ARE THE CONSEQUENCES OF NOT BEING WIRED?

The telephone, contrary to popular belief, is _not_ ubiquitous. In fact, a 1992 study revealed that 25% of households in the U. S. below the poverty line did not possess a telephone (Doctor, 1992). One of my closest friends, a principal at an inner-city school in Los Angeles, whenever she must discuss an important issue with a parent (usually because a child is not in school), literally must drive to that parent's low-income rental, often in some of the most dangerous areas of Los Angeles. She does this because she cares. If she did not, her children would become further statistics, slipping through the cracks of our educational system. How do you ensure a family that cannot even afford a phone equal access to technology?

Similarly, while Americans in particular take for granted their automobiles, a notable segment of society cannot afford to own them. Lack of access to an automobile significantly impacts these persons economically. It is well-known in the U. S. that poorer individuals living in inner-cities pay _more_ for groceries than their suburban counterparts. It is a simple matter of supply and demand in our market economy. Because these individuals cannot drive to other supermarkets, they must shop in the same neighborhood, driving up demand, lessening supply, and increasing cost. How do you ensure access to technology when you cannot ensure access to inexpensive milk and bread?

If one can show that telephones and automobiles are not nearly as pervasive as they seem, how does that affect the belief that we will one day have universal access to networks and technology? Plainly, this indicates that the belief technology will be as universal as the telephone may prove to

IR056705

be false. Significant research supports this assertion. There are segments of society far behind in comparison to others. The ratio of students to a computer is much greater in schools with higher percentages of minorities than those with few minorities (Anderson, 1992). In addition, schools with students from lower socioeconomic populations also have a significantly higher ratio of students to a computer than schools from middle- or upper-income neighborhoods (QED, 1997). Further, per pupil spending overall and specifically in the area of technology is lower in schools from poorer neighborhoods (QED, 1997). Obviously, if you spend less and possess fewer computers, you have an equity problem.

However, even before addressing the equity problem, we must first answer the larger question "why do we need to provide access?" What are the consequences of not getting online? To answer simply, access to telecommunications and technology will be essential for future social and economic viability. Our global society increasingly depends on telecommunications and technology. Visionaries predict such wondrous future possibilities as home and body area networks (Bell, 1997), prosthetic devices aiding memory and recall (Maes, 1997), virtual feudalism (Denning, 1997), and the eventual convergence of telephone, television, and telecommunications wiring (Carey, 1997). More recently, reports indicate that many jobs are being offered exclusively online (Wasserman, 1997). Also, those with access to the Internet can often find bargains and discounts not available any other way (Wasserman, 1997). Similarly, education and learning is being conducted online more and more. Kendall Hamilton and Susan Miller note in a recent _Newsweek_ article that "professors will increasingly trade their ivory towers for spires of silicon." (Hamilton, 1997, p. 12) Students can get undergraduate degrees, certificates, MBAs, even doctorates online (Wasserman, 1997). One day we may have a virtual education system that dispenses "altogether with age-based grades and allow[s] pupils to progress independently." (Hamilton, 1997, p.12) What does this mean for persons not wired? We know that one's economic class relates directly to one's level of educational attainment (Schuler, 1997; Hornbeck, 1991); we are discovering that one's education will very soon be tied to one's ability to get online; therefore, "getting online" is not only access to information and resources, it is access to learning and to power. "Technology is power. Education is power. Communication is power. The digital have all three." (Katz, 1997, p. 191)

Well-known Italian essayist Umberto Eco warns us that we should avoid creating a society in which only privileged few have access. In the future, he posits, class will be determined not so much by economics, although that will certainly be a side-effect, but more specifically by access

to wire, to "getting online" (Marshall, 1997). In order to counter the effect that such a digital division might have on our society, we must carefully look at the possibilities and plan accordingly. We must look at what it means to be "getting online": what are the social, cultural, and economic implications of actually finding and accessing a network. To understand such implications, it might be useful to focus on three aspects of "getting online": identifying areas that need access, designing a physical infrastructure, and designing a technologic interface.

WHAT IS "GETTING ONLINE"?

Research clearly indicates that access to technology in education is effective and critical in terms of "student performance, student motivation, teacher satisfaction, and other important educational outcomes" (Glennan, 1996, p. 36; Collis, 1996; Rossi, 1994). However, establishing that access is important is only half the battle. We must actually design the access. Access or, as I call it, "getting online" entails much more than merely building a building, running some wire, and dropping in a few workstations. We need to 1) identify where access is needed; 2) design the facilities that will house the access; and 3) ensure that the interfaces between the devices that provide access and the access itself are culturally and linguistically accessible.

WHERE SHOULD WE PUT ALL THIS STUFF?

In a perfect world, students would have access to technology at school and parents would be responsible for providing access both to their children and to themselves at home. However, minorities and individuals from lower socio-economic backgrounds are significantly less likely to have access to computers both at home and at school (Rossi, 1994; Rockman, 1995; Resmer, 1995; Doctor, 1992; Anderson, 1992). Solutions for ensuring such access range from giving every student a computer and modem to take home (Rockman, 1995) to providing 24-hour access to computer labs at the university level (Resmer, 1995). In addition, these models can be augmented by providing technologic access to parents and childless individuals at the community level (Schuler, 1997; Marshall, 1997; Wasserman, 1997; Rossi, 1994). Access must be provided for everyone: parents, teenagers not in school, childless individuals, even for children not yet in school. We know early exposure to computers is critical for technological success (Collis, 1996). In order to provide access for everyone, we need to bring technologic access to the community. Already, pilot programs are popping up around the globe: InnVision in San Francisco (Wasserman, 1997); the Seattle Community Network; the

Cleveland FreeNet; Community Memory in Berkeley (Schuler, 1997); Umberto Eco's Multimedia Arcade in Italy (Marshall, 1997). We need to look closely at these programs and study their successes and learn from their failures. But we also need to begin thinking about how we take the next step. How do we truthfully integrate technology into the community? Simply bringing technology to the community may not be enough. We need to think about _how_ we bring technology to the community, and not just use the community as a dumping grounds.

HOW DO WE BUILD COMMUNITY-BASED TECHNOLOGICAL FACILITIES?

This turns out to be a much more difficult question than anticipated. We know that learning is contextual (Lave, 1991). We know that learning has a lot to do with comfortable environments (Rockman, 1995). We know that you must have strong support structures and continuous access to master practitioners in order to learn well (Glennan, 1996; Collis, 1996; Rossi, 1994). Further, more recent research reveals that empowered learning is also related to child welfare, social welfare, health and well-being, family-importance, strong communities, and interagency collaboration (Lawson, 1997). You have to design a facility that is built around the community. You have to get your community to buy into your vision on its own accord before you even begin to _plan_ to build a physical space. You have to get real. After all, we are talking about homeless persons, dealers, people without jobs, persons on welfare, persons perhaps intimidated by all your studies and all your research. As Jonathon Kozol points out, people in underserved communities have seen our ideas come and go; maybe they think we never helped in the past; maybe they don't want us there (1991). What are we going to do differently this time to make our efforts at providing equity work?

Well, to start, we have to stop talking about empowering people and just do it. Let the community hire us, and let them have the power to fire us if they think we are not succeeding (Lawson, 1997). Build a counseling center, a social welfare center, a family-resource center. Staff these centers with individuals from the community, with parents and students. Build centers but also provide jobs. Ask the community members what _they_ want and commit your resources for at least three years. Communities are used to seeing resources centers come and go. Show them you are serious by committing not only yourself but also your resources. Collaborate. Bring in businesses to your center. Provide child-care. House eligibility workers and case workers in the same building. Have a community health clinic staffed by volunteer doctors in the same building. Make the

individuals who come to your community center feel welcome and wanted. And by the way, build a technology center too. In designing these centers, you begin to see how technology is a smaller piece of a much more daunting problem, that of providing an equitable society. However, as with any task, in can only be accomplished by taking one step at a time. It is up to you to decide which steps to take, which pieces to build upon, and which parts to bring in at a later time. Do not be discouraged by attempting to do everything at once.

HOW DO WE MAKE OUR TECHNOLOGY UNDERSTANDABLE AND ACCESSIBLE?

To begin to empower individuals by providing them access to technology, we must also understand that their frames of reference and understanding of the world may be different from ours. Again, we need to get real and concrete. If we are providing services to people from the street, we need to be prepared that language can be rough, different, mannerisms can be abrupt, difficult to understand. Some may come to a center high. Are we prepared to deal with that? Are we sensitive to the fact that theirs may be a different way of life? Or do we continue to look down on them, preach from above, further creating a divisive cultural gap, a culture of us vs. them?

In addition to providing services to people from the street, we will also be providing services to individuals from different cultural backgrounds: Hispanic, Southeast Asian, Russian, many others. Are we prepared to deal with these varied cultures and languages as well? An important and often overlooked impediment of online communications is a linguistic one--both in terms of cultural language _and_ jargon. Designers of technology utilize not only their own particular cultural language, but also a technical language as well. It is dangerous to assume that others possess the same linguistic understanding. For example, as a speaker of Standard American English, I find it difficult to operate even in such a closely related country as England. The culture is different. If I may be so bold without insulting my English cousins, the culture is foreign to me. I do not understand why the street has look right written on it as I am attempting to cross and, because I am American, I look left as I always do and then nearly get killed because, as we Americans like to say, the English drive on the wrong side of the road. Even though the English have been so kind as to write, in bright white letters, "look right," my culture is so ingrained in my psyche that I ignore the warnings.

In the above example, the English have given me a clear warning, yet even that is not enough to stop me from making a near fatal error. Are we designing systems online that might be even worse because they lack even such simple cultural warnings? Many designers of computing systems are American and Standard American English-speakers often fallaciously believe that language is intuitive, when, in fact, it is not. We are not born with an inherent understanding of a particular language (Denning, 1997). Further, when we finally do master a particular language, our understanding of that language does not transfer to non-native speakers. That is to say, idiom and/or linguistic meaning from one person's perspective does not always translate well to that of another. My circle of friends and contacts know that when I say "boot" I mean start up the computer, but to someone without a cultural understanding of what it means to "boot," we are truthfully speaking a foreign language. The field of Human-Computer Interaction refers to design mechanisms that take cues from established linguistic phenomenon as "natural language" (Baecker, 1995). However, I argue that "natural language" is extremely contextual. Given the types of persons designing the interaction, "natural language" refers to their own cultural, linguistic reality. "Natural" can only be natural to native speakers of the language with a great deal of mastery and an understanding of the technical jargon. Presently, a heated debate rages in this country over the appropriateness of ebonics. I am quite certain that should an individual with mastery of ebonics design a computer interface, those without that particular linguistic skill would be at a loss as to how to navigate in it. If we frown upon such ethnocentric design, why is it then acceptable to design computers in such a way as to confuse not only non-native speakers, but those whose mastery might be considered "lacking" as well?

Put simply, why do native Standard American English- speakers with a high level of mastery assume that others should understand, read the manual, or get out of the way? We are severely limiting others' access to technology by engaging in such behavior. We must admit that language can be an impediment and act appropriately. Designers must work collaboratively with persons who possess a multicultural perspective as well as non-native speakers in order to design interfaces that are accessible to persons from varying cultural and linguistic backgrounds. In online communications in particular, we must temper all our interactions with the understanding that language has limitations. This is why dialogue in online communication is so important. If you do not understand what I am trying to say, send me an email and make me clarify. Perhaps someday we will have software that can translate what I say to an appropriate language or mode of understanding. In the meantime, we must address the problem, not

ignore it and hope the rest of the world will just learn English or learn English better.

WHAT DOES IT ALL MEAN?

Ironically, equitable access may be possible only as technology becomes more powerful and less obvious. That is, until I can write this in my own idiomatic, ethnocentric Standard American English, and you can read it in your own idiomatic, ethnocentric whatever, real, global communication probably cannot take place. However, the fact that such tools do not yet exist should not stop us from making honest attempts to build better online communities. We must begin to think about the larger questions. What does it mean to be online? Why do we need to be online? How can we empower society to get online? Why do we need society to be online? How do we account for cultural, linguistic differences online? And although we may not have the answers to such powerful and difficult questions, we can certainly start somewhere.

1) We can stop alienating individuals by understanding and celebrating their differences and by building in them a sense of community. We can accomplish this by listening to them and including them in our community-planning processes. We can build collaborative, inclusive community centers, rather than preconceived modeled ones.

2) We can design interfaces that are easily understandable and accessible by those who may not have the skill-mastery level or linguistic understanding we assume is appropriate for technology. We can accomplish this by including persons who can provide significant cultural and linguistic contributions in our design planning.

3) We can build trust in technology by building trust in society. We can accomplish this by tying technologic success to social and community successes. We can further accomplish this by training and hiring people in the community who then become the trainers of fellow community-members.

4) We can design facilities that utilize the best technology in environments where persons can sit, be comfortable, and realize their own potentials. We can accomplish this by providing strong social, technical, and instructional support.

5) Finally, we can design technology in such a way that it begs to be used rather than begs to be ignored.

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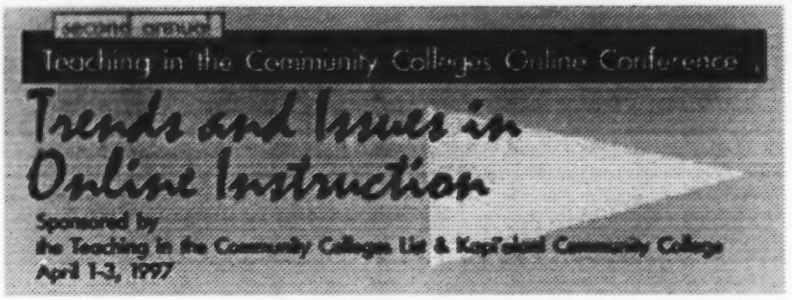
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